



## 教學計劃表 Syllabus

|   |   |                             |                                 |   |                |
|---|---|-----------------------------|---------------------------------|---|----------------|
| 課程名稱(中文)<br>Course Name in Chinese  | 水產資源學   |                             | 學年/學期<br>Academic Year/Semester | 113/1   |                |
| 課程名稱(英文)<br>Course Name in English  | Fisheries Biology   |                             |                                 |   |                |
| 科目代碼<br>Course Code   | NRES53820   | 系級<br>Department & Year     | 碩士                              | 開課單位<br>Course-offering Department  | 自然資源與環境學系      |
| 修別<br>Type  | 選修 Elective   | 學分數/時間<br>Credit(s)/Hour(s) | 3.0/3.0                         |   |                |
| 授課教師<br>Instructor  | /黃文彬  |                             |                                 |   |                |
| 先修課程<br>Prerequisite  |   |                             |                                 |   |                |
| 課程描述 Course Description   |   |                             |                                 |   |                |
| <p>水產資源的研究與調查，是源起於海洋魚類之漁獲量為何會年年變動的疑問，也就是水產資源的自然變動問題，並且考量人類之漁撈行為會對資源造成何等影響，進而探討過漁與適正漁獲量的問題。因此，水產資源學是一門與漁業關係密切、探討水產資源生物數量變動的學問。本課程將從水產資源學的定義、單位與組成、個體與群體的成長、資源變動的基本原理與模式建構、以及相關學門的認識，引導學生瞭解水產資源評估之重要性、資源評估之模式與應用，進而探討與評估水產資源受到人類開發、自然界中非生物因素及生物因素等影響之動態變化，並且說明水產資源保育與永續利用之間如何取得平衡及瞭解水產資源研究與漁業管理的最新發展趨勢。</p> |   |                             |                                 |   |                |
| 課程目標 Course Objectives  |   |                             |                                 |   |                |
| <p>水產資源的研究與調查，是源起於海洋魚類之漁獲量為何會年年變動的疑問，也就是水產資源的自然變動問題，並且考量人類之漁撈行為會對資源造成何等影響，進而探討過漁與適正漁獲量的問題。因此，水產資源學是一門與漁業關係密切、探討水產資源生物數量變動的學問。本課程將從水產資源學的定義、單位與組成、個體與群體的成長、資源變動的基本原理與模式建構、以及相關學門的認識，引導學生瞭解水產資源評估之重要性、資源評估之模式與應用，進而探討與評估水產資源受到人類開發、自然界中非生物因素及生物因素等影響之動態變化，並且說明水產資源保育與永續利用之間如何取得平衡及瞭解水產資源研究與漁業管理的最新發展趨勢。</p> |   |                             |                                 |   |                |
| 系專業能力<br>Basic Learning Outcomes  |   |                             |                                 | 課程目標與系專業能力相關性<br>Correlation between Course Objectives and Dept.'s Education Objectives |                |
| A   | 能覺知多元的自然科學與社會科學理論並具備研究能力<br>To have knowledge of natural and social science theories  |                             |                                 | ●   |                |
| B   | 具備自然資源與人類社會議題之調查分析、規劃與經營之能力<br>To be able to investigate, analyze, plan, and manage both natural resource and human social issues                     |                             |                                 | ●   |                |
| C   | 具備將環境倫理與生態思想落實於永續性生活型態的能力<br>To implement sustainable lifestyles based on environmental ethics and ecological principles                              |                             |                                 | ●   |                |
| D   | 能以整全式的觀點來解析環境問題，並具備發展系統性解決方案的能力<br>To resolve environmental issues and develop systematic solutions with a global perspective                         |                             |                                 | ●   |                |
| E   | 具備系統分析、未來思考、溝通協調與團隊合作的能力<br>The ability to analyze, plan, communicate, and coordinate with others (teamwork)  |                             |                                 | ○   |                |
| F   | 具備終身學習、國際視野與外語溝通的能力<br>To instill the values of lifelong learning, an international perspective, and the ability to communicate in a foreign language |                             |                                 | ○   |                |
| 圖示說明 Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated   |   |                             |                                 |   |                |
| 授課進度表 Teaching Schedule & Content   |   |                             |                                 |   |                |
| 週次 Week   | 內容 Subject/Topics   |                             |                                 |   | 備註 Remarks     |
| 1   | Introduction  |                             |                                 |   | 9/10 (Tuesday) |

|    |   |                            |
|----|---|----------------------------|
| 2  | Moon festival   | 9/17                       |
| 3  | Chap. 1 Fisheries and Modelling<br>Chap. 2 Simple Population Models=>2.3 Density-Independent Growth | 9/24 (Kevin)               |
| 4  | Chap. 4 Computer-Intensive Methods<br>2.4 Density-Dependent Models=>2.8 Simple Yield-per-Recruit    | 10/1 (Lin)<br>10/1 (Kevin) |
| 5  | Chap. 11 Surplus Production Models=>11.6 Uncertainty of Parameter Estimates                         | 10/8 (Kevin)               |
| 6  | Climate Change Conference   | 10/15                      |
| 7  | 11.7 Risk Assessment Projections=>11.9 Concluding Remarks   | 10/22 (Kevin)              |
| 8  | Chap. 12 Age-Structured Models=>12.2 Cohort Analysis  | 10/29 (Kevin)              |
| 9  | 12.3 Statistical Catch-at-Age=>12.4 Concluding Remarks  | 11/5 (Kevin)               |
| 10 | Chap.13 Size-Based Models   | 11/12(Jason)               |
| 11 | Chap. 9 Growth of Individuals => 9.3 Alternatives to Von Bertalanffy                                | 11/19 (Jason)              |
| 12 | 9.4 Comparing Growth Curves => 10.5 Deriso' s Generalized Model                                     | 11/26 (Jason)              |
| 13 | 10.6 Residual Error Structure => 10.10 Concluding Remarks   | 12/3 (Jason)               |
| 14 | NPFC SSC meeting  | 12/10                      |
| 15 | NPFC SC meeting   | 12/17                      |
| 16 | Chap. 6 Statistical Bootstrap Methods   | 12/24 (Kevin)              |
| 17 | Chap. 7 Monte Carlo Modelling   | 12/31 (Kevin)              |
| 18 | Flexible teaching week  | 1/7                        |

### 教學策略 Teaching Strategies

- 課堂講授 Lecture
  分組討論 Group Discussion
  參觀實習 Field Trip  
 其他 Miscellaneous:

### 教學創新自評 Teaching Self-Evaluation

#### 創新教學(Innovative Teaching)

- 問題導向學習(PBL)
  團體合作學習(TBL)
  解決導向學習(SBL)  
 翻轉教室 Flipped Classroom
  磨課師 Moocs

#### 社會責任(Social Responsibility)

- 在地實踐 Community Practice
  產學合作 Industry-Academia Cooperation

#### 跨域合作(Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching
  跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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學期成績計算及多元評量方式 Grading & Assessments

| 配分項目<br>Items                       | 配分比例<br>Percentage | 多元評量方式 Assessments |          |          |          |          |          |          |    |
|-------------------------------------|--------------------|--------------------|----------|----------|----------|----------|----------|----------|----|
|                                     |                    | 測驗<br>會考           | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |
| 平時成績 General<br>Performance         |                    |                    |          |          |          |          |          |          |    |
| 期中考成績 Midterm Exam                  |                    |                    |          |          |          |          |          |          |    |
| 期末考成績 Final Exam                    |                    |                    |          |          |          |          |          |          |    |
| 作業成績 Homework and/or<br>Assignments |                    |                    |          |          |          |          |          |          |    |
| 其他 Miscellaneous<br>(_____)         |                    |                    |          |          |          |          |          |          |    |

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

課程教材網址(含線上教學資訊, 教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.  
Personal website can be listed here.)

其他補充說明 (Supplemental instructions)